

REMARKS

The Office Action mailed May 20, 2009 and the Advisory Action mailed August 6, 2009 have been carefully reviewed and the foregoing amendment has made in consequence thereof.

Claims 1-10 and 24-32 are pending in this application. Claims 1-10 and 24-32 stand rejected.

Applicant thanks Examiner Stinson for the telephonic interviews conducted on August 28, 2009 and September 3, 2009 with Applicant's representative David S. Kim to discuss the interim examination instructions issued by the Office on August 24, 2009. For example, the interim examination instructions recite:

[A] printed circuit board or a computer programmed with executable instructions is typically construed as a base structure combined with functional descriptive material that could create a patentable distinction over the prior art. . . .

For computer implemented processes, the "machine" is often disclosed as a general purpose computer. In these cases, the general purpose computer may be sufficiently "particular" when programmed to perform the process steps. Such programming creates a new machine because a general purpose computer, in effect, becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software. To qualify as a particular machine under the test, the claim must clearly convey that the computer is programmed to perform the steps of the method because such programming, in effect, creates a special purpose computer limited to the use of the particularly claimed combination of elements (i.e., the programmed instructions) performing the particularly claimed combination of functions.

In light of the interim examination instructions, it was agreed that the Examiner would give appropriate patentable weight to the recitations of a controller.

The rejection of Claims 1-10 under 35 U.S.C. § 103(a) as being unpatentable over U.K. Patent Application GB 2 052 251 to Licentia Patent-Verwaltungs-GmbH (hereinafter referred to as "Licentia") in view of either U.S. Patent No. 3,223,108 to Martz, Jr. (hereinafter referred to as "Martz") or U.S. Patent No. 5,315,847 to Takeda et al. (hereinafter referred to as "Takeda") is respectfully traversed.

Initially, as agreed during the Examiner interview, Applicant respectfully requests that the Examiner give appropriate patentable weight to the recitations of a controller. The claimed controller is a special purpose controller limited to the use of the particularly claimed combination of elements performing the particularly claimed combination of functions. As such, Applicants respectfully submit that the claimed controller qualifies as a particular machine that is patentable over the cited references.

Licentia describes a washing machine that includes a means for measuring surface tension, a means for measuring pH, and a means for measuring conductivity. The washing machine measures an electrical conductivity of each washing liquid during operation of the machine and fresh water to be used in the machine, compares the measured amounts of electrical conductivity, and controls the supply of washing agent based on the comparison.

Martz describes a washing machine including an electrical apparatus, a sensing control (48), and a timer (49) to control operation of the washing machine. A timer motor (70) drives a series of cams (A)-(E) that actuate a series of switches (71)-(79) for supplying power from a pair of supply lines (80) and (81) to the electrical apparatus. More specifically, power is supplied to sensing control (48) through a transformer (90) having a primary winding (91) and secondary windings (92) and (93). Secondary winding (92) includes resistors (94) and (95), sensing units (32) and (40), and a resistor (96) in series with a sensing unit (32). Sensing unit (32) measures a conductivity of the supply water and a conductivity of the rinse water, and sensing control (48) compares the conductivity of the supply water to the conductivity of the rinse water.

Takeda describes a washing machine that includes a washing/dehydrating tank (5), an agitation blade (6), a water storage tank (7), and a sensor (15) for detecting an electric conductivity of washing water in washing/dehydrating tank (5) and water storage tank (7). During a rinsing step, sensor (15) detects a conductivity of the rinsing water before rotation of agitation blade (6) and a conductivity of the rinsing water after rotation of agitation blade (6). The conductivities are compared and calculated to determine a number of rinsing cycles to achieve an appropriate rinsing operation in accordance with the detergent contained in washing/dehydrating tank (5). A detection signal of the soiled condition of washing water from an inverter (43(B)) is in a rectified rectangular wave form.

Independent Claim 1, as amended, positively recites a controller including “a microcomputer coupled to a memory storing instructions that, when executed by the microcomputer, directs said controller to: determine a desirable achievable rinse level; at predetermined fluid levels during the rinse cycle, measure an average liquid conductivity; calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level; compare the calculated overall change in conductivity to the desirable achievable rinse level; and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level.” Applicant respectfully submits that such recitations are not inherent in washing machines or controllers. (Emphasis added). Rather, such recitations are a claimed feature of the special purpose controller described in the present patent application.

Applicant respectfully submits that no combination of Licentia and Martz or Takeda describes or suggests a controller that includes a microcomputer coupled to a memory for storing instructions that, when executed by the microcomputer, directs the controller to determine a desirable achievable rinse level, measure an average liquid conductivity at predetermined fluid levels during the rinse cycle, calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level, compare the calculated overall change in conductivity to the desirable achievable rinse level, and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level. Rather, Licentia describes a method of determining a number of rinsing operations based on when the rinsing water reaches the conductivity of the water introduced into the washing machine, Martz describes a control circuitry, including sensors and resistors, configured to rinse a detergent from a wash load using conductivities of water supplied to a washing machine and of a liquid within the washing machine, and Takeda describes a method of determining a number of rinsing operations based on a difference in the conductivity of the water in the washing machine before rotation of the agitation blade and after rotation of the agitation blade in the rinse cycle.

Moreover, no combination of Licentia and Martz or Takeda describes or suggests a resistance network including a sensor and a voltage source operable to provide a sinusoidal wave input or a square wave input to facilitate deterring mineral buildup on the sensor. It is asserted on page 2 of the Office Action that “Martz (see fig. 2) and Takeda (see fig. 7) each

disclose the resistance network, resistor and voltage source in a conductivity sensor as claimed.” Applicant respectfully disagrees with the Examiner’s finding and interpretation.

Figure 2 of Martz is a schematic circuit diagram of a control, and Figure 7 of Takeda is a wiring diagram of an oscillation circuit of a sensor. Notably, nowhere does Martz or Takeda describe or suggest a voltage source operable to provide a sinusoidal wave input or a square wave input to facilitate deterring mineral building up on a sensor.

Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Licentia in view of Martz or Takeda.

Claims 2-10 depend from independent Claim 1. When the recitations of Claims 2-10 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 2-10 likewise are patentable over Licentia in view of Martz or Takeda.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 1-10 be withdrawn.

The rejection of Claims 24-32 under 35 U.S.C. § 103(a) as being unpatentable over either U.K. Patent Application GB 2 266 898 to Hotpoint Limited (hereinafter referred to as “Hotpoint”) or European Patent Application 0 686 721 to Whirlpool Europe B.V. (hereinafter referred to as “Whirlpool”) in view of Martz, Takeda, or U.S. Patent No. 5,260,663 to Blades (hereinafter referred to as “Blades”) is respectfully traversed.

Hotpoint describes a washing machine including a tub (3) and a conductivity sensor (12) that detects a conductivity of liquid in tub (3). A rinse operation of the washing machine is based on the conductivity of liquid in tub (3). More specifically, a rinse stage is terminated based on a rate of change of the conductivity of liquid.

Whirlpool describes a washing machine including a conductivity sensor (14), a control unit (15), a current sensor (16), a pressure sensor (17), and a temperature sensor (18). Control unit (15) receives signals from sensors (14), (16), (17), and (18) and controls solenoid valves (8), (12), (13), a flowmeter (18A), a heating element (19), a discharge pump (20), and/or an electric motor control member (21). Conductivity sensor (14) measures a conductivity of water that has come into contact with clothes and a conductivity of water that has been introduced to a tub (3) but has not yet come into contact with clothes, and control

unit (15) operates in accordance with fuzzy logic based on the measured conductivities of water.

Martz and Takeda are described above.

Blades merely describes a cell including electrodes (14) and (16) that measure a conductivity of liquid positioned between electrodes (14) and (16).

Independent Claim 24, as amended, positively recites a fluid delivery and draining assembly including “a microcomputer coupled to a memory storing instructions that, when executed by the microcomputer, directs said fluid delivery and draining assembly to: determine a desirable achievable rinse level; at predetermined fluid levels during the rinse cycle, measure an average liquid conductivity; calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level; compare the calculated overall change in conductivity to the desirable achievable rinse level; and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level.” Applicant respectfully submits that such recitations are not inherent in washing machines or microcomputers. (Emphasis added). Rather, such recitations are a claimed feature of the special purpose microcomputer described in the present patent application.

Applicant respectfully submits that no combination of Hotpoint or Whirlpool and Martz, Takeda, or Blades describes or suggests a fluid delivery and draining assembly that includes a microcomputer coupled to a memory for storing instructions that, when executed by the microcomputer, directs the fluid delivery and draining assembly to determine a desirable achievable rinse level, measure an average liquid conductivity at predetermined fluid levels during the rinse cycle, calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level, compare the calculated overall change in conductivity to the desirable achievable rinse level, and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level. Rather, Hotpoint describes a washing machine that terminates a rinse stage based on a rate of change of a conductivity of a liquid, Whirlpool describes a washing machine that operates in accordance with fuzzy logic based on a measured conductivity of water, Martz describes a control circuitry, including sensors and resistors, configured to rinse a detergent from a wash load using conductivities of water

supplied to a washing machine and of a liquid within the washing machine, Takeda describes a method of determining a number of rinsing operations based on a difference in the conductivity of the water in the washing machine before rotation of the agitation blade and after rotation of the agitation blade in the rinse cycle, and Blades merely describes a cell including electrodes that measure a conductivity of a liquid.

Accordingly, for at least the reasons set forth above, Claim 24 is submitted to be patentable over Hotpoint or Whirlpool in view of Martz, Takeda, or Blades.

Claims 25-32 depend from independent Claim 24. When the recitations of Claims 25-32 are considered in combination with the recitations of Claim 24, Applicant submits that dependent Claims 25-32 likewise are patentable over Hotpoint or Whirlpool in view of Martz, Takeda, or Blades.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 24-32 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Respectfully submitted,

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